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Pressure Test Readings as a Maturity Index for Elberta Peaches
Preliminary Report of Studies Made in 1948 and 1949

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Introduction

Although U. S. grades for peaches require that they be mature, there are no very definite or objective means of determining maturity. Consequently some immature lots of fruit may be passed by the inspection service that ripen with poor quality and are detrimental to the peach market.

Studies were started in 1948 to evaluate various possible indices of maturity such as firmness of flesh as measured by pressure test, flesh flavor, and texture, color of skin and flesh, and color of pit and freedom of pit from flesh. The pressure test data are presented in this report.

A review of the literature on indices of maturity for peaches shows that most investigators have considered the firmness of the fruit as measured by pressure test, the best single index of maturity. Certainly this measure of firmness is an indication of the shipping quality of the fruit (i.e. its resistance to bruising and the time required for it to become soft). Despite rather extensive studies on the relation of pressure test to maturity, no standard has been established above which peaches would be graded immature and below which they would be graded mature. Consequently the pressure tester is not used by the inspection service to establish maturity. For these reasons the primary emphasis in these investigations has been to determine whether such a standard is feasible and if so, what the standard should be.

Pressure test standards for maturity have been established for pears in California, based on the average value of a composite sample. This has been satisfactory because the pressure test values for individual pears within a sample do not usually vary greatly. Peaches, on the other hand, may show great variability in pressure test values at any one picking. Even in the experimental samples (table 1 to 4) for these studies, in which the fruit was more closely graded for maturity than commercial lots, the values within samples frequently varied as much as 7 pounds between the firmest and softest peaches. Because of this great variability in peaches, a standard to determine the maturity of individual peaches would probably be preferable to one based on average for a composite sample.

It is likely that a standard based on individual peaches would also be more practical for the inspection service in order for the inspectors to establish the percentage of peaches in a sample that is immature. In making an inspection of a lot in which some of the fruit is suspected of

being immature, it is customary for the inspectors to set aside the greener, poorly-filled-out peaches for further observation (cutting to observe flesh texture and pit freedom). Determination of firmness by means of a pressure tester would constitute an additional method of establishing the maturity of such fruit. A tolerance of 10 percent for defective peaches, including immature peaches is allowed in U. S. Grades. A standard is needed, therefore, that will not permit as much as 90 percent of the peaches in immature lots to pass (assuming no other defects).

In this report the possibility of using average pressure test values as an index of maturity is studied, but primary emphasis is placed on the distribution of pressure test values of individual peaches in samples, some of which are barely mature and some of which are immature but bordering on mature in order to establish a maturity standard based on individual fruit values.

Material

For an index of maturity to be useful it should be applicable to fruit grown over a wide range of conditions. Fruit for these investigations, therefore, were obtained from young and mature trees bearing heavy and light crops and from orchards in widely separated localities representing different cultural and climatic conditions. Following is a description of the sources of fruit used: All were of the Elberta variety.

1948 season

Orchard A (Duke) located near Fort Valley, Georgia on a sandy loam soil of the Coastal Plains. Peaches were obtained from young trees (6-7 years) bearing very heavy and moderate crop loads and from mature trees bearing very light and moderately light crop loads.

Orchard B (Davidson) also located near Fort Valley, Georgia on a sandy loam soil. Peaches were obtained from mature (13 year old) trees bearing heavy and light crops.

Orchard C (Wertz) located at Quincy, Pennsylvania, on a clay loam soil. Peaches were obtained from young, fairly large and vigorous trees bearing light crops.

Orchard D (Walker) located near Chambersburg, Pennsylvania, on a clay loam soil. Peaches were obtained from large mature trees bearing heavy and light crops.

1949 season

Orchard E (Allen) located near Salisbury, Maryland, on a light sandy loam soil. Peaches were obtained from mature trees bearing moderately heavy

crop loads. A late summer soil application of nitrogen was applied to half of the trees. The season was unusually dry, and the heavy crop failed to develop good size or dessert quality even when picked in an advanced stage of maturity. Because of the drought it is unlikely that sufficient nitrogen was taken up to influence fruit maturity or quality.

Orchard F (Townsend) located near Millsboro, Delaware, on a sandy loam soil. Peaches were obtained from mature trees bearing moderate crops. Although only about 25 miles from orchard E the effects of the drought were much less apparent in the fruit from orchard F. It sized up well and developed satisfactory quality due, perhaps, to the lighter crop load and somewhat heavier soil.

Orchard G (Smith) located near Cheswold, Delaware, on a sandy loam soil. Peaches were obtained from mature trees bearing moderate crop loads. This fruit also appeared to be less affected by the drought than that from orchard E.

Orchard H (Pomona) located near Olcott, New York, on a clay loam soil. Peaches were obtained from mature trees bearing moderate crop loads. Here too the season was unusually dry and the fruit somewhat small. The drought was broken by a heavy rain about a week previous to the first picking.

Orchard I (Garman) also located near Olcott, New York. Peaches were obtained from fairly large, vigorous young trees bearing moderate crop loads. Seasonal conditions were as described for orchard H. The peaches were generally small (75 percent under 2 inches at the first picking).

Methods

The experimental samples were picked from trees reserved for this purpose starting before any of the fruit was mature and continuing at intervals of 3 days until most of the fruit was definitely mature. At each pick all of the fruit on certain branches or sections of the trees were removed so as to obtain a random sample representing all stages of maturity present at that time. After picking the fruit was sorted into different degrees of maturity on the basis of ground color. In the earliest samples all of the fruit was green and no differences in maturity could be distinguished. In samples picked later the peaches showing a break in color (usually yellowing of only a small area on the exposed side) were separated from those that were still green. The green peaches were designated "least mature" and those showing a break in color "medium mature". In later pickings third category showing considerable yellowing could sometimes be separated and was designated "most mature". Results for the "most mature" lots representing an advanced stage of maturity, and likewise, results for the "least mature" lots in some of the earliest pickings that were obviously immature are not presented. The "medium mature" samples represented about what would be picked commercially as a shipping stage of maturity.

The subsamples representing each maturity designation were sorted into different sizes (by least diameters) at 1/4 inch intervals and the number of peaches in each size recorded. Peaches under 1-3/4 inches in least diameter were considered to be non-commercial size and data from such fruit are not included in the tables. A sample of 20 peaches was taken from each maturity subsample proportionately from the different sizes for determination of firmness (pressure test) at harvest. The remaining peaches of the different sizes were recombined and held at prevailing outside temperatures for ripening.

The pressure test determinations were made on the pared flesh of each cheek and at the suture using a 5/16 inch diameter plunger. The tests were made in the orchard within an hour of picking.

The fruit held for ripening was examined at 2 to 3 day intervals to determine the time required to ripen and the quality of the ripened fruit. These data showed which samples ripened with satisfactory quality in a reasonable length of time and indicated which were mature. It was observed that under some conditions (for example, a heavy crop under drought conditions) the fruit never attained satisfactory dessert quality even when picked in an advanced (nearly tree-ripe) stage of maturity. For that reason the dessert quality of the ripened fruit was not an entirely satisfactory measure of which lots had been picked in a mature stage. Therefore, greater dependence was placed on the length of time required to ripen. Generally, peaches that ripened in 10 days or less at prevailing temperatures were considered to have been mature when picked.

Results

The average values of the pressure test determinations on the cheeks and the distributuon of the values for individual peaches are given for the immature samples in table 1 and for the mature samples in table 2. Corresponding data for determinations made on the sutures are given in tables 3 and 4. Data for some of the very early picking in which the fruit was very immature are not included. Thus the immature samples represent fruit closely approaching a mature condition and usually included some fruit that ripened satisfactorily. The mature samples also were largely borderline in that they were barely passable and approached an immature condition.

The average pressure test readings on the cheeks of the different samples of immature peaches ranged from 12.7 to 20.1 pound with a grand average for all samples of 16.0 pounds (table 1). Corresponding values for the mature samples ranged from 8.3 to 16.8 pounds with a grand average of 14.0 pounds (table 2). The median between the average for the mature lots and the immature lots is 15 pounds. If this were used as the standard

for maturity the pressure test of 49 out of 56 (87.5 percent) mature lots were lower than the standard and would be rated mature and 37 out of 50 (74 percent) of the immature lots were above this and would be rated immature.

The values of the pressure tests made on the sutures (tables 3 and 4) averaged appreciably lower than on the cheeks. The range in the averages for immature samples was 10.0 to 16.7 pounds and the average for all samples was 13.6. The corresponding values for the mature samples were 5.3 to 14.1 average 10.9. The median value between the mature and immature samples was 12.25 pounds. Using this as a standard for maturity resulted in 73 percent of the mature samples being rated as mature and 76 percent of the immature samples being rated as immature.

Although the mature and immature samples could generally be separated by means of the average values (as pointed out earlier) this would be less practical for use by the inspection service than a separation using individual values. A study of the distribution of the individual values was made to determine whether mature and immature samples could be separated on this basis.

About 33 percent of the individual peaches in the immature lots tested 17 pounds or above on the cheeks (table 1) whereas 96 percent in the mature lots tested below 17 pounds (table 2). Using this as a standard (with a 10 percent tolerance) 91 percent of the mature samples complied with the standard (assuming no other defects) but 42 percent of the immature lots also complied (table 5). This permits too many immature lots to pass as mature. Dropping the standard down to 16 pounds allowed only 66 percent of the mature lots to comply but reduced the number of immature lots that complied to 18 percent. This standard satisfactorily eliminated most of the immature samples but also eliminated a rather high percentage of samples that ripened satisfactorily and were therefore considered to be mature. Lowering the standard to 15 pounds eliminated too many mature samples.

The distribution of pressure test values on the sutures shows that about 30 percent of the peaches in the immature lots tested 15 pounds or above (table 3) and that 96.5 percent of the peaches in the mature samples tested less than 15 pounds (table 4). Using a test of 15 pounds at the suture as a standard for maturity allowed 88 percent of the mature samples to pass as mature but also allowed 46 percent of the immature samples to pass as mature. This permits too many immature lots to pass as mature. Lowering the pressure test standard to 14 pounds allowed 70 percent of the mature lots to pass as mature and eliminate 70 percent of the immature samples. Lowering the standard to 13 pounds caused too many (59 percent) of the mature samples to be graded immature.

Discussion

It is apparent from these data that a pressure test standard cannot be established that will separate all immature lots of peaches from all mature lots. It is also apparent, however, that firmness as measured by pressure test is closely associated with maturity and it seems likely that a standard could be established that would eliminate nearly all immature lots without too seriously delaying the picking of mature fruit. These results indicate that Elberta peaches testing 16 pounds or above on the pared cheeks or 14 pounds or above on the pared suture (using a tester equipped with a 5/16 inch diameter plunger) should be graded immature.

Many of the samples, that were judged to be immature on the basis of the time required to ripen and the quality of the ripened fruit, contained many peaches that were satisfactory. These were usually the larger fruit and presumably were those that were distributed in the lower range of pressure test values. Those lots that were considered to be immature but which came within the pressure test standard for maturity usually contained a large proportion of fruit that ripened satisfactorily and their commercial shipment would not be very serious.

On the other hand, the mature samples that failed to meet the maturity standard usually failed by only a small percentage of the fruit (in excess of the 10 percent tolerance for all defects) being over the standard. Such lots could frequently be brought within the standard by closer grading (removal of the smaller, greener fruit). With other lots it might be necessary to delay picking for 2 to 3 days. With such borderline fruit this delay might be desirable to improve the size, color and possibly the dessert quality of the fruit. Fruit that tests at or above the standard can be permitted to soften to below the standard and still be firm enough for normal commercial handling and long distance shipment. Thus, the failure of some mature (but borderline) lots to meet the maturity standards may not be too serious.

Because softening frequently occurs first at the sutures it was thought that tests made at the sutures might give a more sensitive indication of maturity. The results indicate that tests on the two cheeks and at the suture were about equally satisfactory for Elberta peaches but a standard based on tests at the suture would need to be 2 pounds lower than on the cheeks. Limited studies with Early Hiley indicate that the difference in pressure test readings between immature and mature fruit is greater at the suture and shoulder opposite the suture than at the cheeks indicating that tests at the suture and shoulder would be preferable for Early Hiley.

Pressure test data that have been reported for varieties other than Elberta indicate that the different peach varieties have pressure test

values of approximately the same order of magnitude at maturity. In order to establish reasonably exact standards for other varieties it will be necessary to conduct studies similar to those reported above.

The pressure test data reported here represents only one phase of the studies on maturity indices with Elberta peaches. Records on the other phases will be presented separately.

Table 1. Distribution of pressure test readings on cheeks of individual Elberta peaches in immature lots. 1948-1949 seasons

Orchard and age of trees	Pick	Crop size[1]	Maturity designation	Average pressure test	Peaches Testing: 10.9 lbs. or less	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 to 16.9 lbs.	17.0 to 17.9 lbs.	18.0 to 18.9 lbs.	19.0 to 19.9 lbs.	20.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
A- Young	4	H	Least	16.3					1	3	8	1				13
	4	M	"	17.8							3	6	2	1	1	13
	5	H	"	16.7						6	4	2	2			14
	5	M	"	17.7						1	3	7	1	5		17
A- Mature	3	M	"	17.7						2	2	4	5	1	1	15
	3	L	"	16.8						5	3	7	3	1		19
	4	M	"	16.2						5	10	3	1			19
	4	L	"	16.2					1	7	8	2	1	1		20
	4	M	Medium	15.9					3	6	6	4				19
	5	M	Least	15.0					8	8	3		1			20
	5	L	"	15.5				1	5	4	9	1				20
	5	M	Medium	16.0				1		8	7	3				19
	6	M	Least	14.9				1	6	11	2					20
B- Mature	4	H	Least	15.9					4	5	6	2	1			18
	4	L	"	17.3						4	2	10	1	1	1	19
	5	H	"	14.4				8	5	5	1					19
	5	L	"	14.9				3	9	5	2	1				20
	6	H	"	15.1			1	3	3	7	3	2				19
	6	L	"	14.6			1	4	7	7		1				20
	7	H	"	13.5		1	6	6	4	3						20
	7	L	"	13.8			3	7	8	1	1					20
C- Young	1	L	Least	16.0				1	1	8	4	5	1			20
	2	L	"	14.5				6	8	5	1					20
	3	L	"	14.4			1	5	9	2	3					20
D- Mature	2	H	Least	15.3			1	3	6	4	3	2	1			20
	2	L	"	15.9				1	4	5	5	5				20
	3	H	"	13.4		1	6	6	6	1						20
	3	L	"	15.1			4	3	4	3	3		2			20
	3	H	Medium	13.0		3	7	7	1	1		1				20
	3	L	"	15.0		1		2	5	7	4		1			20
	4	H	Least	12.7		4	7	8	1							20

Table 1. Continued

Orchard and age of trees	Pick	Crop size 1/	Maturity designation	Average pressure test	Peaches Testing: 10.9 lbs. or less	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 to 16.9 lbs.	17.0 to 17.9 lbs.	18.0 to 18.9 lbs.	19.0 to 19.9 lbs.	20.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
E-	1 2/	H	Least	19.0							1	4	5	3	7	20
Mature	1 3/	H	"	17.8						2	2	4	4	3	1	16
	2 2/	H	"	20.1									3	6	10	19
	2 3/	H	"	18.0							2	5	9	2		18
	3 2/	H	"	17.8							3	8	5	4		20
	3 3/	H	"	17.8						1	3	7	4	3	1	19
	4 2/	H	"	17.0						3	5	8	4			20
	4 3/	H	"	15.1			2	2	3	8	3	2				20
	2 2/	H	Medium	17.6	1				2	1		3	7	3	3	20
	2 3/	H	"	17.1		1			1	3	3	2	6	2	1	19
	3 2/	H	"	16.7		2	1			3	3	4	4	1	2	20
	3 3/	H	"	17.5					1	1	4	5	6	2	1	20
F-	2	M	Least	18.0				1			3	5	6	3	3	21
Mature	3	M	"	18.4						1	1	4	8	2	4	20
	4	M	"	15.9					3	8	6	2	1			20
G-	1	M	Least	14.8			2	2	4	5	5					18
Mature	2	M	"	14.7			4	2	6	3	3	2				20
H-	1	M	Least	15.9					1	11	6		2			20
Mature																
I-	1	M	Least	15.0				1	5	9	3					18
Young																
Average				16.0												
Range				12.7-20.1												
Total 50 lots					1	13	46	84	135	198	162	134	97	44	36	951
Percentage distribution					0.1	1.4	4.9	8.8	14.2	20.8	17.1	14.1	10.2	4.6	3.8	

1/ Crop size - H=Heavy, M=Medium, L=Light
2/ No nitrogen
3/ Summer nitrogen fertilization

Table 2. Distribution of pressure test reading on cheeks of individual Elberta peaches in mature lots. 1948-1949 seasons

Orchard and age of trees	Pick	Crop size[1]	Maturity designation	Average pressure test	Peaches Testing: 10.9 lbs. or less	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 to 16.9 lbs.	17.0 to 17.9 lbs.	18.0 to 18.9 lbs.	19.0 to 19.9 lbs.	20.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
A- Young	5	H	Medium	16.8					1	2	5	3	2	1		14
	5	M	"	16.3				1	1	2	3	1	1			9
	6	H	Least	14.5				5	7	6	1					19
	6	M	"	14.8					11	4	2					17
	6	H	Medium	13.2	1	3	3	4	5	1	1					18
	6	M	"	14.6	1			1	8	4	4					18
A- Mature	4	L	Medium	15.7				1	3		3	3				10
	5	L	"	14.5			1	2	4	2	1					10
	6	L	Least	15.2			1	3	2	8	5		1			20
	6	M	Medium	13.3	3	1	3	3	4	5	1					20
	6	L	"	13.6	3		1	8	3	2	1	2				20
	7	M	Least	14.2				4	4	2						10
	7	L	"	14.9					6	3	1					10
	7	M	Medium	13.9		3	2	3	6	5	1					20
	7	L	"	11.2		1	3	5	8	2	1					20
B- Mature	5	H	Medium	14.6			1	3	2	2	2					10
	5	L	"	10.8	3		2	3	1	1						10
	6	H	"	14.5	1			1	3	4	1					10
	6	L	"	14.4			1	4	7	6	2					20
	7	H	"	13.6		1	4	7	6	2						20
	7	L	"	13.4			5	10	3	2						20
C- Young	3	L	Medium	13.4	1		7	7	2	1		1	1			20
	4	L	Least	13.5		1	5	8	4	1		1				20
	4	L	Medium	12.5	1	3	9	4	3							20
	5	L	Least	12.8		2	6	6	1							15
	5	L	Medium	12.0	3	6	7	3	1							20
D- Mature	4	L	Least	14.0			2	10	3	2	2	1				20
	4	H	Medium	12.4	3	4	5	5	3							20
	4	L	"	13.2	1	3	5	5	3	1	1	1				20
	5	H	Least	13.3		2	4	9	3	2						20
	5	L	"	14.6			1	3	2	3			1			10

Table 2. Continued

Orchard and age of trees	Pick	Crop size[1]	Maturity designation	Average pressure test	Peaches Testing: 10.9 lbs. or less	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 to 16.9 lbs.	17.0 to 17.9 lbs.	18.0 to 18.9 lbs.	19.0 to 19.9 lbs.	20.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
	5	H	Medium	12.8	2	1	6	9	1	1						20
	5	L	"	12.8	3	4		7	6							20
E-	4[2]	H	Medium	14.2	3			2	5	6	1	3				20
Mature	4[3]	H	"	14.4		1		5	5	6	3					20
	5[2]	H	"	14.3	3			2	1	7	7					20
	5[3]	H	"	16.1				2	2	4	6	4	2			20
F-	5	M	Least	15.2			1	3	3	6	5	2				20
Mature	5	M	Medium	13.9		1	1	2	4	2						10
	6	M	"	12.7	1	4	6	5	3	1						20
G-	1	M	Medium	15.2		1	1	2	3	6	5	1	1			20
Mature	2	M	"	14.2	1		1	2	9	6	1					20
	3	M	"	13.4			3	11	5	1						20
	4	M	"	13.2	1	1	3	7	6	2						20
H-	2	M	Least	14.6				5	8	4	3					20
Mature	3	M	"	14.9				4	6	6	2			1		19
	1	M	Medium	14.7	1			2	3	2	1				1	10
	2	M	"	14.9			2	1	7	7	1	2				20
	3	M	"	13.8	1	2		5	10		1	1				20
	4	M	"	12.0	8	2		5	3			1		1		20
I-	2	M	Least	14.3				6	10	4						20
Mature	3	M	"	13.9			1	10	5	4						20
	4	M	"	11.5	5	2	7	4	2							20
	2	M	Medium	13.7			2	10	8							20
	3	M	"	13.0			10	9	1							20
	4	M	"	8.3	13	5	2									20
Average				14.0												
Range				8.3-16.8												
Total - 56 lots					63	54	124	248	236	150	74	27	9	3	1	989
Percentage distribution					6.4	5.5	12.5	25.0	23.9	15.2	7.5	2.7	0.9	0.3	0.1	989

1/ Crop size - H=Heavy, M=Medium, L=Light 2/ No nitrogen 3/ Summer nitrogen fertilization

Table 3. Distribution of pressure test readings on sutures of individual Elberta peaches in immature lots. 1948-1949 seasons

Orchard and age of trees	Pick	Crop size[1/]	Maturity designation	Average pressure test	Peaches Testing: 6.9 lbs. or less	7.0 to 7.9 lbs.	8.0 to 8.9 lbs.	9.0 to 9.9 lbs.	10.0 to 10.9 lbs.	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
A-	4	H	Least	13.7						1		8	3	1		13
Young	4	M	"	14.0								2	8	2	1	13
	5	H	"	13.6							4	2	7	1		14
	5	M	"	14.7								2	7	6	2	17
A-	3	M	Least	16.1									3	3	9	15
Mature	3	L	"	15.1							2	2	3	4	8	19
	4	M	"	14.7								2	10	6	1	19
	4	L	"	14.1								8	7	3	2	20
	4	M	Medium	13.9							2	6	9	1	1	19
	5	M	Least	13.8							5	4	5	6		20
	5	L	"	13.2						2	5	6	5	1	1	20
	5	M	Medium	14.5							1	3	9	4	2	19
	6	M	"	11.5						3	10	5		1	1	20
B-	4	H	Least	14.0	1							3	9	4	1	18
Mature	4	L	"	14.7				1			1	3	4	3	7	19
	5	H	"	12.9						1	5	11	2			19
	5	L	"	13.0						2	8	7	1	1	1	20
	6	H	"	12.6						4	5	5	5			19
	6	L	"	12.4					1	4	8	6		1		20
	7	H	"	11.5					3	12	2	3				20
	7	L	"	12.1						9	5	5	1			20
C-	1	L	Least	13.0					1	2	5	4	8			20
Young	2	L	"	11.5					4	7	8	1				20
	3	L	"	11.3				1	5	7	4	3				20
D-	2	H	Least	12.4					1	4	8	5	1	1		20
Mature	2	L	"	12.5					1	4	6	7	2			20
	3	H	"	10.8				3	8	5	3	1				20
	3	L	"	12.0			1		3	7	4	2	1	1	1	20
	3	H	Medium	10.4			3	3	10	2	1	1				20
	3	L	"	11.0			1	1	6	6	6					20
	4	H	Least	10.0			4	6	5	2	3					20

Table 3. Continued

Orchard and age of trees	Pick	Crop size[1]	Maturity designation	Average pressure test	Peaches Testing: 6.9 lbs. or less	7.0 to 7.9 lbs.	8.0 to 8.9 lbs.	9.0 to 9.9 lbs.	10.0 to 10.9 lbs.	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
E-	1[2]	H	Least	16.6								1		4	15	20
Mature	1[3]	H	"	15.8								2	1	5	8	16
	2[2]	H	"	16.7									1	3	15	19
	2[3]	H	"	15.7									2	5	11	18
	3[2]	H	"	16.0									4	6	10	20
	3[3]	H	"	15.6									3	8	8	19
	4[2]	H	"	14.6							1	4	7	5	3	20
	4[3]	H	"	12.6					1	4	5	8	2			20
	2[2]	H	Medium	14.7	1					1		1	5	5	7	20
	2[3]	H	"	14.5				1				2	7	5	4	19
	3[2]	H	"	13.5	1	2	1				1	2	4	3	6	20
	3[3]	H	"	15.4				1				3	2	4	10	20
F-	2	M	Least	15.5							1		4	6	10	21
Mature	3	M	"	16.5								1	1	5	13	20
	4	M	"	13.9							4	7	6	1	2	20
G-	1	M	Least	12.1						6	8	4				18
Mature	2	M	"	11.8				1	2	6	9	2				20
H-	1	M	Least	15.4								1	7	5	7	20
Mature																
I-	1	M	Least	13.6							4	4	8	2		18
Mature																
Average				13.6												
Range				10.0-16.7												
Total 50 lots					3	2	10	17	52	101	144	159	174	122	167	951
Percentage distribution					0.3	0.2	1.1	1.8	5.5	10.6	15.1	16.7	18.3	12.8	16.6	

1/ Crop size - H=Heavy, M=Medium, L=Light
2/ No nitrogen
3/ Summer nitrogen

Table 4. Distribution of pressure test readings on sutures of individual Elberta peaches in mature lots. 1948-1949 seasons

Orchard and age of trees	Pick	Crop size[1]	Maturity designation	Average pressure test	Peaches Testing 6.9 lbs. or less	7.0 to 7.9 lbs.	8.0 to 8.9 lbs.	9.0 to 9.9 lbs.	10.0 to 10.9 lbs.	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
A- Young	5	H	Medium	13.3					2		2	3	4	3		14
	5	L	"	13.4						1	2	2	3	1		9
	6	H	Least	11.5				1	4	5	6	3				19
	6	L	"	11.7					1	11	4	1				17
	6	H	Medium	9.5	1	2	1	4	7	1	2					18
	6	L	"	11.4	1			2	1	5	7	1	1			18
A- Mature	4	L	Medium	12.9						1	4	3	1	1		10
	5	L	"	12.7				1		1	1	5	2			10
	6	L	Least	12.8						2	7	7	3	1		20
	6	H	Medium	11.3	1		1		4	4	4	5	1			20
	6	L	"	11.7	1		1		1	6	5	4		2		20
	7	H	Least	11.8					1	3	4	2				10
	7	L	"	12.2						3	3	4				10
	7	H	Medium	11.6			1	1	3	7	2	5		1		20
	7	L	"	11.2		1		1	4	7	5	1	1			20
B- Mature	5	H	Medium	11.6				1		4	4	1				10
	5	L	"	7.8	5	1					2	2				10
	6	H	"	11.8		1			1		6		2			10
	6	L	"	11.4		1		1	3	6	5	4				20
	7	H	"	10.9		2		2	1	9	6					20
	7	L	"	10.7				2	8	6	4					20
C- Young	3	L	Medium	9.9	1	1	1	3	9	3	1		1			20
	4	L	Least	10.5				4	11	4		1				20
	4	L	Medium	8.1	4	4	3	6	3							20
	5	L	Least	9.2	1	1	2	4	5	2						15
	5	L	Medium	5.7	13	2	3	2								20
D- Mature	4	L	Least	9.4	3	1	2	1	7	4	2					20
	4	H	Medium	9.1	2	2	2	6	6	1	1					20
	4	L	"	5.9	12	2	4	1	1							20
	5	H	Least	9.9		1		7	7	5						20
	5	L	"	10.2		1	1	1	2	4	1					10
	5	H	Medium	9.0	1	1	6	9	2	1						20
	5	L	"	5.3	14	2	1	2	1							20

Table 4. Continued

Orchard and age of trees	Pick	Crop size 1/	Maturity designation	Average pressure test	Peaches Testing: 6.9 lbs. or less	7.0 to 7.9 lbs.	8.0 to 8.9 lbs.	9.0 to 9.9 lbs.	10.0 to 10.9 lbs.	11.0 to 11.9 lbs.	12.0 to 12.9 lbs.	13.0 to 13.9 lbs.	14.0 to 14.9 lbs.	15.0 to 15.9 lbs.	16.0 lbs. or more	Total No.
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
E-	4 2/	H	Medium	11.8	3		1				5	4	5	2		20
Mature	4 3/	H	"	12.4				1	3	1	4	7	4			20
	5 2/	H	"	12.2	1	1	1			1	3	7	6			20
	5 3/	H	"	13.5			1			2	2	6	4	5		20
F-	5	M	Least	12.7						3	9	6	2			20
Mature	5	M	Medium	11.1			1	1	2	1	4	1				10
	6	M	"	11.3				2	3	8	7					20
G-	1	M	Medium	12.1						4	13	3				20
Mature	2	M	"	11.4			1		6	4	7	2				20
	3	M	"	11.2			2		4	8	4	2				20
	4	M	"	9.8	1	1	4	3	4	3	3	1				20
H-	2	M	Least	14.1							2	3	11	4		20
Mature	3	M	"	13.3				1	1	1	2	4	8		2	19
	1	M	Medium	12.9				1	1	1	2	1	1	2	1	10
	2	M	"	13.7	1			1	1				12	2	3	20
	3	M	"	11.8	2		1		2	2	5	4	3	1		20
	4	M	"	9.3	6	2	2		3	1	2	2	1	1		20
I-	2	M	Least	13.1						3	4	6	6	1		20
Mature	3	M	"	12.7					1	4	4	8	2	1		20
	4	M	"	8.5	5	4	1	4	1	1	2	1		1		20
	2	M	Medium	12.4				1		4	7	6	2			20
	3	M	"	11.1		2		2	3	3	8	2				20
	4	M	"	5.3	17	1			2							20
Average				10.9												
Range				5.3-14.1												
Total 56 lots					96	37	44	79	132	161	189	130	86	29	6	989
Percentage distribution					9.7	3.7	4.4	8.0	13.3	16.3	19.3	13.2	8.7	2.9	0.6	

1/ Crop size - H=Heavy, M=Medium, L=Light 2/ No nitrogen 3/ Summer nitrogen fertilization

Table 5. Percentage of samples that would be properly classified with different pressure test standards (allowing 10 percent tolerance for maturity and assuming no other defects).

Pressure test standard	Position of test	Immature samples excluded	Mature samples admitted
Pounds		Percent	Percent
17 or lower	cheeks	58	91
16 or lower	cheeks	82	66
15 or lower	cheeks	92	36
15 or lower	sutures	54	88
14 or lower	sutures	70	70
13 or lower	sutures	88	46